

Chemical Age

VOL. II No. 201

8 August 1974

NATURE'S CATALYSTS (1)



Mankind's First Scientific Discovery

The production of fire was almost certainly mankind's first scientific discovery, and combustion has been added to the list of catalytic reactions by the comparatively recent recognition of the role of water vapour in the flame. Among all the discoveries of man, none has had such far-reaching effects as the discovery of how to make and use fire. And elevated temperatures have played a major part in chemical experiments and processes throughout the ages.

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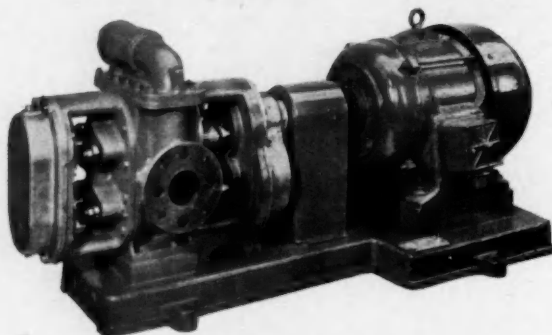
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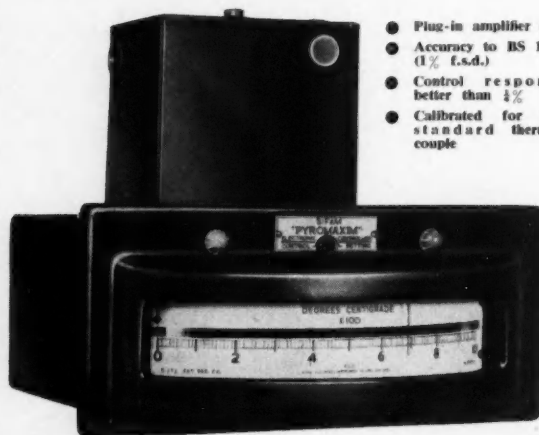


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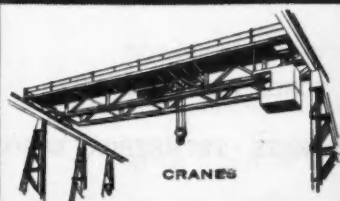


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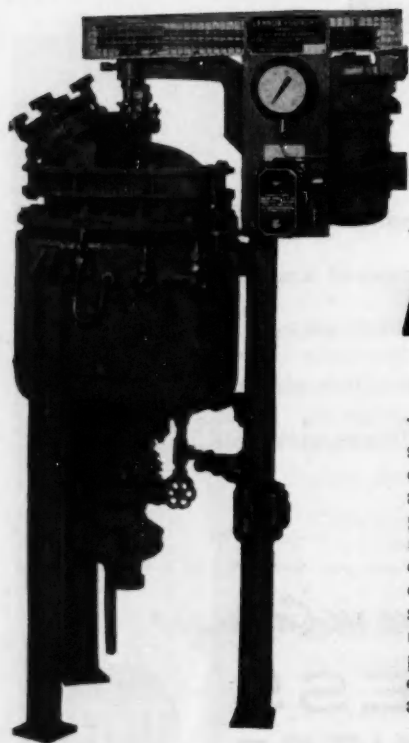
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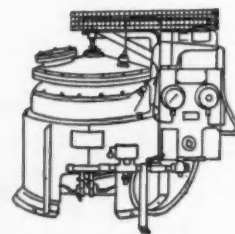
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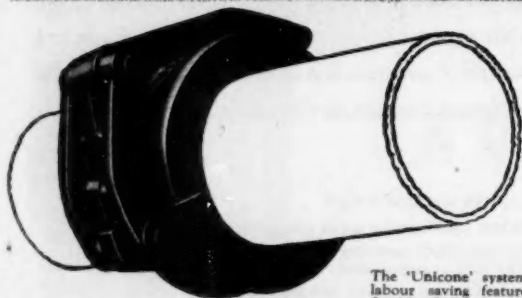
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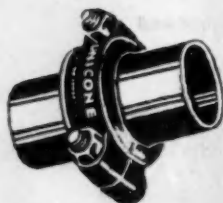
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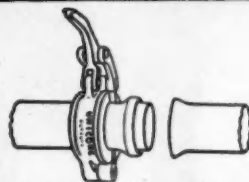
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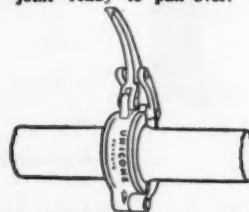
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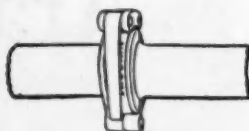
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8 August, 1959
P.107

Fumaric capacity in the U.S. is

said to be about 22m.lb. divided among National Aniline, Monsanto, Pittsburg Coke and Bzura Chemical. Generally maleic producers convert 15% of production to fumaric acid, or according to demand.

Nearer home, the Ruhröl concern, Mathias Stinnes AG, are extending capacities. Production of phthalic anhydride will be increased by 20% simply by an improvement in the manufacturing process. Maleic anhydride production, at present 2,000 tonnes a year, will be brought up to 3,000 tonnes annually by 1960. Heavy demand for fumaric acid (Ruhröl is W. Germany's only producer) has led the company to plan an extension of this capacity too; present monthly output of 65 tonnes will have become one of 100 tonnes by early next year. On a longer-term planning policy, production of maleic anhydride is to be increased to 4,000 tonnes by the end of 1960 and of fumaric acid to 1,800 tonnes annually by the same time.

Ftalital SpA, Milan, Italy, announced last August (C.A.16 August, 1958, p.258) that they would build a 2.2 m.lb. maleic anhydride plant at Bergamo - the first of its kind in Italy. This will also be a Scientific Design Co. unit. In France, a maleic plant is operated by Compagnie Francaise des Matieres Colorantes (Francolor), Villiers St. Paul, and in Spain Resinas Poliesteres SA, Unquinesa and UEE with Saint-Gobain of France have received permission for a proposed maleic anhydride plant having a capacity of 1,500 kg./day.

As it takes about 18 months to set up a maleic anhydride plant, the new additions in the U.K., U.S. and Europe should be in operation by 1961. From now until then demand for anhydride will be strong, but after that overcapacity looms ahead.

SYSTEMIC WARBLE FLY KILLERS. Dow Agrochemicals Ltd. plan to market the systemic warble fly killers Etrolene and Ruelene and will make an announcement this week-end about their availability and use. During the past year they have been carrying out an experiment on 650 head of cattle.

CS₂ FROM EXHAUST GASES. A plant costing £500,000 for the recovery of carbon disulphide from factory exhaust gases is now in operation at one of the two production units at Courtaulds' Greenfield Works, Holywell, North Wales.

Working in conjunction with fume-absorption equipment recently installed at the Greenfield unit for removing hydrogen sulphide from the exhaust stream, the plant removes an unusually high proportion of carbon disulphide, so that the combined effect is a big reduction in air pollution.

I.C.I. IN ARGENTINA. Imperial Chemical Industries Ltd. are contributing £1,500,000 to a programme of modernisation and development costing £2,350,000 being undertaken by their subsidiary, Industrias Quimicas Argentinas Duperial S.A.I.C. It involves the development of a site on the right bank of the Parana River at San Lorenzo, some 200 miles north of Buenos Aires. Plants for making sulphuric acid, carbon disulphide and hydrogen peroxide are to be built to replace units of lower capacity and there will be a new plant for phthalic anhydride, for which there is a rapidly growing demand in Argentina.

POWELL DUFFRYN ENGINEERING. Cambrian Wagon & Engineering Co. Ltd., a subsidiary of Powell Duffryn Ltd., has changed its name to Powell Duffryn Engineering Co. Ltd.

In recent years the company has established itself in the manufacture of equipment for the petroleum, chemical and allied industries, such as standard cylindrical and rectangular tanks.

Address of the company is now Cambrian Works, Maindy, Cardiff-Tel. Cardiff 29611.

FERTILISER DUTY PROPOSED. An application for the imposition of an anti-dumping duty on ammonium sulphate from Belgium and Western Germany is being considered by the Board of Trade. Representations should be made by 10 August to the Board of Trade, Tariff Division, Horse Guards Avenue, London, S.W.1.

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 D DECONTAMINATION OF D
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COMMENTING on the growing use of mercury in industry, the report of the Chief Inspector of Factories (p.110 this issue) says that although it is well known that mercury is poisonous it is not so well known that its vapour pressure is such that if sufficient of the liquid is exposed in a closed room at normal temperatures the concentration of vapour in the air may rise to more than 100 times the maximum safe concentration.

Should mercury be spilt and not be immediately cleaned up, normal traffic will break it up into tiny droplets exposing a large surface area in all. These will lodge in any imperfections of surfaces.

A successful method of decontamination is to treat affected areas with a wash based on equal parts of slaked lime and flowers of sulphur. After twenty-four hours the wash is removed with clean water. This method of cleaning ensures that any microscopic droplets of mercury are converted into sulphide, which eliminates the danger of vaporisation from any material that cannot be mechanically removed.

OVERSEAS RESEARCH COUNCIL. Effect has now been given to the Government's announcement last year that an Overseas Research Council is to be established. Dr. R.S. Aitken, Vice-Chancellor of Birmingham University, has accepted the chairmanship. Lord Hailsham, announcing this last week, said that the U.K. Research Council, the Department of Scientific and Industrial Research, the Medical Research Council, and the Agricultural Research Council were willing to provide advice and assistance on research matters falling within their respective fields to any Commonwealth country desiring assistance. The Overseas Research Council will provide for co-ordination of assistance and will form a central point to which the Commonwealth Govern-

ments and research institutions can refer. It will also advise the Privy Council Committee, consisting of Lord Hailsham, Lord Home, Secretary of State for Commonwealth Relations, Mr. Lennox-Boyd, Colonial Secretary and Mr. Selwyn Lloyd, Foreign Secretary. Other members of the council are Sir Jock Campbell, Sir Charles Dodds, Sir Harold Himsworth, Sir Joseph Hutchinson, Dr. R. Lewthwaite, Prof. T. McMichael, Sir Harry Melville, Mr. G.D.W. Nye, Sir Arnold Plant, Sir William Slator, Dr. H.G. Thornton and Sir Solly Zuckerman.

SHELL CHEMICAL'S NEW DEPARTMENTS.

Shell Chemical Co. Ltd. announce the formation of two new departments in head office, London -- purchasing department and packaging department. This follows other organisational changes within the company and the decision that it will in future purchase its own chemical feedstocks and process chemicals, a function previously carried out on its behalf by Shell Refining Co.

Mr. M.G. Welsh (from Shell Refining) is appointed manager of purchasing department. Manager of packaging will be Mr. A.H. Williams (formerly buying department).

KANIGEN CAPACITY EXTENDED. Facilities for production of Kanigen (nickel phosphorus plate) have recently been extended at Albright and Wilson (Mfg.) Ltd's, Oldbury, Birmingham, plant, in order to meet the demand for this method of plating.

At Farnborough Air display, A. & W. will exhibit Kanigen-plated titanium or light alloy, and weight-saving Kanigen aluminium hot-air valves for fuel anti-waxing.

GLASS EVAPORATOR FOR $\text{Th}(\text{NO}_3)_4$.

QVF Ltd., Fenton, Stoke-on-Trent, have received an order for an all-glass evaporator unit from Thorium Ltd., Widnes, for use in making thorium nitrate. The material for all the gas mantles in this country as well as many exported will go through the plant.

VVV
 V FIRE RESEARCH REPORT V
 V STRESSES DUST HAZARDS V
 VVV

USE of dry powder as an extinguishing agent for fires in flammable liquids has increased considerably in the last few years, the report of the Fire Research Board of the Department of Scientific and Industrial Research and Fire Offices' Committee indicates (Fire Research 1958, H.M.S.O. 5s.net). Earlier results of work carried out have been used to form the basis of a Ministry of Works' specification for sodium-bicarbonate - based powders. Small amounts of metallic stearates are added to sodium bicarbonate to prevent absorption of water; talc is also added to improve flow properties of the powder in the equipment. In conjunction with the Government Chemist's Dept., laboratory methods of investigating the efficiency of the additive have been carried out. Specific surface of the powder and the density of the pellet, as well as the nature of the additive, affected crushing strength. Crushing strength of untreated sodium bicarbonate and of a bicarbonate-based powder containing only calcium hydroxy phosphate (known to be unsatisfactory under operating conditions) were both higher than 500 gm. Powders prepared with small amounts of metallic stearates had crushing strengths in the region of 100 gm.

Effect on flammability limits of n-hexane of a commercial grade of difluorochlorobromomethane (CF_2ClBr) containing 25% difluorobromomethane (CF_2Br_2) was reported in Fire Research 1957. During the current year its value as an extinguishing agent has been assessed by comparing it with chlorobromomethane on an 18-in. dia. petrol fire. Tests indicate the material was "probably more efficient than chlorobromomethane" and this showed promise as an extinguishing agent. Dust Explosions. Dust explosion

hazards in factories have been studied. Among materials listed for their liability to explode when dispersed into a dust cloud are gentian dust, liquorice, a mixture containing 50% phenolic resin and 50% asbestos, Bismark Brown, acetanilide, p-acetamino-benzene sulphonyl chloride, acetyl sulphonamide, mixtures of benzoyl peroxide with 80% mineral filler, cyclohexanone peroxide with filler, cashew resin polymers, acid alizarine (Black K), 2-aminothiazole, a mixture of potassium dichromate with guanidine nitrate, adipic acid, alkyd moulding materials (with and without mineral fillers), silicon, disintegrated aluminium swarf and chippings, magnesium swarf, starch, gelatine and a mixture of starch and gelatine.

ACID GAS REMOVAL

Now operating in European countries is the Giammarco-Vetrocoke process for removing acid gases from syntheses of natural gas. Using the G-V process, CO_2 and H_2S can be removed separately or in the same plant. To remove H_2S , sodium or potassium carbonate solutions containing tri- and pentavalent arsenic are used and under proper conditions are stated to be selective for H_2S in the presence of CO_2 . To remove CO_2 additives such as arsenic oxide, selenious and tellurous acids are employed. Better performances than with conventional monoethanolamine (MEA) or carbonate removal processes are claimed, because of amine loss in the former case and, in both cases, because activated solution can be regenerated with much less steam consumption. Also G-V treating solution is non-corrosive. Treatment costs are per Mscf. in case of natural gas stream of 90m.c.f.d. at 1,000 p.s.i.g. and 100°F , containing 28% by volume CO_2 and 2gr/100 scf. of H_2S : G-V process - 4.1¢ (air regeneration); potassium carbonate - 8.2¢; aqueous MEA - 10.1¢.


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Two directors of I.C.I. Lime Division, Mr. L.B. Ryder, chairman, and Dr. F.P. Stowell, research and development director, will relinquish their appointments on 31 Dec. on reaching the retiring age after 36 and 32 years' service respectively.

Staff changes in Shell Chemical Co. Ltd. as a result of the opening of their new ammonia plant at Shell Haven include a special appointment in the Agricultural technical department for Mr. T.N. Reid, formerly head of fertiliser sales. Mr. H.J.A. Millachip, who was head of the fertiliser section in agricultural technical department, becomes head of fertiliser sales. The new head of the fertiliser section in technical department is Mr. J.A. Clifford, who was an adviser with the Ministry of Agriculture and since he joined Shell has been concerned with development of Nitra-Shell.

Brig. Wilfrid Mavor has been appointed to the board of Electric Reduction Co. of Canada Ltd., producers of phosphorus, phosphates and chlorates, one of the Albright and Wilson group. He is president of Ferro Enamels (Canada) Ltd.

Mr. T.H. Brooke, managing director of Redferns (Bredbury) has been re-elected chairman of the Plant Lining Group of the Federation of British Rubber and Allied Manufacturers. Mr. A.E. Allcock of the Dunlop Rubber Company, has been elected vice-chairman.

Mr. Gilbert Dodd of Monsanto Chemicals Ltd. has been appointed a director of H.H. Cole & Co. Ltd.

Mr. Robert Langford, who is in charge of the underground gasification project at Newman Spinney, near Chesterfield, is visiting India

to discuss a plan for making gas from coal underground there.

M. Rene Massigli has been made a director of Les Filles de Calais S.A. the French subsidiary of Courtaulds.

Obituary

The death occurred on 26 July of Coun. Charles Cooper, of 105 Birkby Hall Road, Huddersfield, at the age of 68. He was a former joint managing director and head of the gas and chemical engineering division of W.C. Holmes and Co., Ltd. Coun. Cooper was a member of the Livesey Professorship Committee of the University of Leeds.

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T TRADE NOTES T
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Hilger and Watts Ltd., makers of instruments for analysis, surveying, photogrammetry, metrology and industrial inspection, have appointed Mr. D.G. Heywood, A.Met., of 21 Kirkstall Road, Sheffield 11, (Tel. Sheffield 64226) as representative for Yorkshire, Lancashire, Cheshire and North Lincolnshire.

Evershed & Vignoles Ltd., manufacturers of instruments and electronic equipment, announce removal of their Scottish area office into larger accommodation. The new address is: Evershed & Vignoles, Ltd., Scottish Area Office, 30 Rutland Square, Edinburgh, 1, Telephone No. as before is Fountainbridge 3056.

Resydrol Water-Soluble Resins.
Cray Valley Products, Ltd., have concluded a manufacturing agreement with Vianova Kunstharz Ag., Vienna., to produce their Resydrol water-soluble synthetic resins in this country.

Kali-Chemie Reforming Plant. Power Gas Corporation Ltd. inform us that the reforming plant ordered by Kali-Chemie A.B., of Hanover (C.A. 11 July P.32) was erected at Bad Honningen. The plant will produce high purity hydrogen.

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ANCHOR CHEMICAL. Anchor Chemical Ltd. are paying an interim 5% -- the same as last year.

BEECHAMS. Another record profit should be seen in the half-year statement to 30 September of the Beecham Group, the chairman, Mr. H.G. Lazell, said at the annual meeting. This was only to be expected, he said, with Thomas and Evans' profits for a full six months in the statement, but he also expected the profits of the rest of the business to be greater.

BENN BROS. The directors of Benn Brothers Ltd. publishers of "Chemical Age" recommend payment of final dividend, less tax, for the year ended 30 June 1959, 3% on preference, which with the interim dividend of 3% makes 6% for year; 7½% on ordinary, which with the interim dividend of 5% makes 12½% for the year, as against 15% in previous year.

BOOTS. Mr. J.P. Savage, chairman, said at the annual meeting of Boots Pure Drug Co. Ltd. that he looked forward to this year with considerable optimism. Now that he had studied the first quarter's results he was even more optimistic than when he wrote his statement before the meeting.

BORAX (HOLDINGS). The directors of Borax (Holdings) Ltd., have declared an interim dividend in respect of the year to 30 September 1959, of 1.75d per 5s unit of deferred ordinary stock subject to tax.

BRITISH OXYGEN. Sales of the British Oxygen Co. Ltd. in the half year to 31 March 1959 rose by £2½m. to £26½ million compared with the corresponding period a year ago. Net profit rose from £1,764,000 to £2,106,000. Net profit for full year to 30 September 1958 was £3,334,062. The interim dividend

is maintained at 4%. A total of 12% for 1957-58 included a special interim of 2% in respect of the current year.

GRIFFITHS HUGHES. Although the chairman of Griffiths Hughes, Mr. C.B. Green, does not care to make firm long-term predictions, he says in a statement accompanying the accounts "I cannot be other than optimistic about the immediate prospects." In spite of competition sales are rising.

VITAMINS. The United Molasses Co. has withdrawn its offer for the shares of Vitamins. The reason is that the Vitamins' board feel unable to recommend the offer unless arrangements could be made for a cash alternative of at least 30s a unit. The United Molasses directors did not feel they would be justified in raising their bid.

GERMAN BP. An increase in output by £4.2m. to £25.5m. is announced for BP's German subsidiary. This increase, authorised last December, is to finance investment projects including a refinery and a 50% share in a petrochemical factory owned jointly by BP and Bayer AG.

CELANESE CORP. OF AMERICA. Plans to dissolve the holding company affiliate through which they control two Canadian subsidiaries are reported from Celanese Corp. of America. Canadian Chemical and Cellulose Co. shareholders will vote shortly on the plan. If approved they would receive one share of Columbia Cellulose for each share of Canadian Chemical and Cellulose. Celanese Corp. owns 82% of the 5,040,000 shares of Canadian Chemical and Cellulose.

PRICES OF CHEMICALS. The price of potassium iodide is 6s 10d a lb. for lots of over 1 cwt. and 7s a lb. for quantities under 1 cwt. Iodine prices are 10s 6d and 11s a lb. These figures correct the prices given on 25 July.

Red seal zinc oxide has gone up to £95. 10s a ton.

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ICELAND FERTILISER PROJECT. The board of the Icelandic fertiliser factory are investigating the possibility of adding to the plant to produce a complex fertiliser to replace a proportion of the phosphate and phosphoric fertilisers now imported. Because of power shortage the factory produced only 17,000 tons of nitrogen fertiliser in 1958 compared with 19,000 tons in 1957.

KOREAN FERTILISER PLANT. Output of a new urea fertiliser plant at Chungju, Korea, is expected to be 85,000 tons a year. The plant was originally scheduled to be completed by March 1958 at a cost of \$19,555,000, which has risen to \$36,968,000. A contract has been signed between Korean and U.S. officials for the McGraw Hydrocarbon Co. to service the plant and train staff.

JAPAN EXPORTS LESS FERTILISER. The Ammonium Sulphate Industry Association of Japan has decided to cut production by about 15% in the year beginning 1 August to clear stocks of urea amounting to 100,000 tons and ammonium sulphate (400,000 tons) which have piled up because of slow exports.

USING ITALIAN METHANE. Almost all producers of methane operating in the delta of the Po are taking part in a new company which is to build a plant at Adria for the chemical utilisation of natural gas.

QUEENSLAND'S AMMONIUM SULPHATE PROJECT. Establishment of an ammonium sulphate plant in Queensland at an estimated cost of £6m. is under consideration by Mount Morgan Ltd. Associated with Mount Morgan in this project are Power Gas Corporation of England and Chemical Construction Corp. of New York. Probable site of the plant would be

Rockhampton, 25 miles from Mount Morgan. The factory could use 60,000 tons of Mount Morgan pyrites and 60,000 tons of Callide coal to produce 100,000 tons of ammonium sulphate a year mainly for use as a fertiliser by the sugar industry. Consumption of ammonium phosphate in 1958 totalled 120,000 tons. Present manufacture is mainly in Tasmania.

\$29M. PROTON SYNCHROTRON. A start has been made on the U.S. Atomic Energy Commission's \$29m. Zero Gradient Proton Synchrotron (ZGS) at Argonne National Laboratory. This atom-smasher, which will produce 12.5 Bev (billion electron volts), will be used to study properties of fundamental particles and the behaviour of the 'strange' particles.

HELIUM AND ARGON RECOVERY. American Market Products, of Detroit, Mich. U.S. have developed a process whereby helium and argon are recovered in a purified state for re-use. Filters remove particulate matter, and entrained droplets, oil vapour, water, CO₂ and H₂ if any is present are absorbed in absorbers. Remaining impurities, such as nitrogen and oxygen, are reacted over a catalyst to make them separable. Less than 10 p.p.m. of impurities are claimed for the treated helium and argon.

CHEMICALS FROM SICILIAN OIL. Sincat petrochemical works at Priolo, Sicily, have received from the Gulf Italia Co. the first consignment of local crude oil for the production of fertilisers.

IRAQ SULPHUR INDUSTRY? The Iraqi Government are negotiating with Texas Gulf Sulphur for the exploitation of extensive sulphur beds.

TALL OIL PLANT FOR CANADA. First plant for fractional distillation of crude tall oil (by-product of kraft pulp manufacture) in Canada will be built by Hercules Powder Co. (Canada) Ltd.

Products of the new plant will be resins and fatty acids. The

resins will replace imported materials at present used by the Hercules plant at Burlington, Ontario, for manufacture of pale resin size for the paper industry.

The plant will be built at the Burlington, Ontario, site. It is expected to be in production by June, 1960 and will cost over \$1,000,000.

U.S. TELLURIUM OUTPUT. Last year tellurium production in the U.S. was 170,495 lb., a reduction of 33% compared with 1957. Tellurium, used in the electrochemical and lead alloys, cast iron and rubber industries, is said to have experienced a large-scale increase in demand since the beginning of this year, however.

MELAMINE PLANT FOR POLAND. A melamine plant has been opened as part of the Heydebreck nitrogen works in Poland. Production in the current year will amount to some 300 tonnes and next year to about 600 tonnes. Poland hopes to become an exporter of melamine in due course.

SICILIAN FERTILISERS PLAN. A plant is being added to Stabilimento Akragas at Porto Empedocle, Sicily, in order to use Sicilian potassic salts in the production of compound fertilisers.

DUPONT LICENSE FIBER INDUSTRIES. Fiber Industries, jointly owned by Imperial Chemical Industries Ltd. and Celanese Corp. of America has been licensed by E. I. Du Pont de Nemours Co., to make and market polyester fibre (Terylene) in the U.S. before the basic patent in the U.S. expires in July 1961. Fiber Industries plan to market commercial quantities of their new reron polyester fibre by mid-1960. A plant at Shelly, N.C. is now under construction.

EAST GERMANS' PERLON PLANT: Construction is to begin of a further chemical fibre production plant in East Germany. The plant, to be the country's fourth-largest,

will be built at Guben, near Cottbus, and will come into initial operation in the last quarter of 1962. The first 2,000 tonnes of Perlon are to leave the plant in the course of 1963.

CZECH HYDROGENATION PLANT FOR CHINA.

Techoexport, Czech exporting organisation, has signed a contract for delivery to Communist China of 8,000 tons of plant and equipment for a hydrogenation works to be built at Fuchun. Equipment will include, amongst other items, a complete oxygen plant, measuring and controlling instruments, turbo-compressors and pumps. The plant, most of which will be manufactured by the Kralovopolska Engineering Works at Brno, will be delivered between 1960 and 1963.

DOW BADISCHE'S ACRYLIC ACID PLANS.

More information on Dow Badische's plans for acrylic acid production is now available. Starting materials will be acetylene, carbon monoxide and water. A direct process based on Reppe chemistry, which has been in commercial use at Badische Anilin- and Soda-Fabrik for several years, will be employed.

L.P. POLYTHENE BY SCHOLVEN-CHEMIE.

Shortly in operation will be the new installation of Scholven-Chemie AG, Gelsenkirchen for production of low-pressure polythene using the Ziegler process. Using Scholven-Chemie's own coke-gas ethylene, an annual output of 6,000 tonnes of polythene will be achieved. Capacity for production of nitrogenous fertilisers is to be brought up from a former rate of 23,000 tonnes N per year to one of 45,000 tonnes N annually by late autumn of this year.

LESS CONGO URANIUM. Extraction of uranium in the Belgian Congo in 1958 was below the 1957 level but was sufficient to meet current contracts and to provide a contribution towards Euratom stocks. Annual production is believed to be about 300,000 tons, but exact figures are not published.

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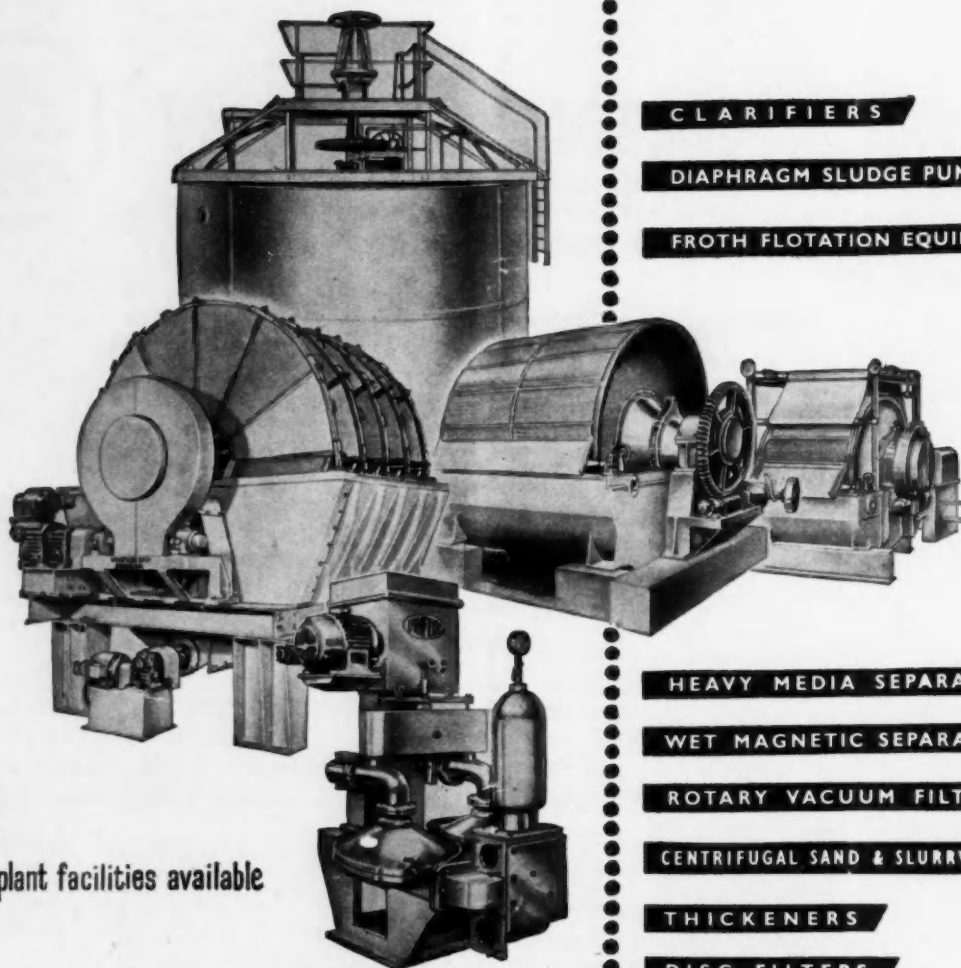
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